

REMARKS

The Office Action of October 26, 2005 has been carefully reviewed and these remarks are responsive thereto. Reconsideration and allowance of the instant application are respectfully requested in view of the amendments and remarks presented in this response.

Upon entry of this amendment, claims 1, 9 and 10 have been amended and new claims 27-31 have been added. Support for these amendments can be found in the specification and claims as originally filed. No new matter has been added. Claims 15-26 have been canceled. Claims 1-14 and 27-31 are pending in this application.

Election/Restriction

Applicants affirm the election, with traverse, to proceed with the invention of Group I, claims 1-14. Claims 15-26 have been canceled without prejudice or admission with respect to Applicants' right to re-file the canceled claims in a divisional application.

Claim Objections

Claim 10 has been amended to depend from claim 9. Withdrawal of this objection is respectfully requested.

Claim Rejection Under 35 USC §112

Claim 9 stands rejected under 35 USC §112, second paragraph, for allegedly being indefinite. The Office Action states that the limitation "carbon additive" is unclear and vague. Claim 9 has been amended to recite "carbon" instead of "carbon additive" to clarify that one of the possible nano additives is carbon.

Claim Rejection Under 35 USC §102

Claim 1-2 and 5-7 stand rejected under 35 USC §102(e) for being unpatentable over Musso et al., U.S. Publication No. 2003/0173720. Reconsideration and withdrawal of this rejection is respectfully requested. Applicants respectfully submit that Musso et al. do not disclose the method of manufacturing a heat exchanger as presently claimed.

Amended claim 1 is directed to a method of manufacturing a heat exchanger that includes simultaneously extruding a first composition and a second composition to form one or more filaments, which include the first composition encased within the second composition. These two-composition filaments are arranged in a predetermined orientation to provide a green body. The green body is subjected to conditions effective for removing the first composition from the filaments and for sintering the second composition to provide a heat exchanger. The

resulting heat exchanger includes one or more channels having walls made of the sintered second composition for containing coolant flow. The channels have inner diameters of no more than about 2000 microns. Claims 2-14 and new claims 27-31 depend from independent claim 1.

Musso et al. do not disclose a method of manufacturing a heat exchanger using extruded filaments that include a first composition encased within a second composition. Instead, Musso et al. disclose that the channeled article is formed using a fixture that defines a cavity. A plurality of core members are first arranged in the cavity and then a matrix forming material is introduced into the cavity, such that the core members then are surrounded by the matrix forming material. The core members are subsequently pulled out from the resulting unitary body. (See para. [0208]).

The Office Action states that Musso et al. teach extruding the core members in paragraph [0209], lines 1-3, and that Musso et al. teach that the core members are removed by heating in paragraph [0219], lines 1-3. Although Musso et al. disclose that each of the core members has an extrudable cross-section, Musso et al. further merely teach that the core members may be single composition members, *i.e.*, solid metal wires, hollow metal tubes, ceramic fibers, or polymeric fibers. At paragraph [0219], Musso et al. disclose a related invention in which the cores can be removed by burning them out rather than pulling them out. As with Musso et al.'s first invention previously described, the article is formed by first arranging a plurality of core members within a cavity and subsequently introducing a matrix forming material into the cavity, such that the matrix forming material then surrounds the core members. The core members are then burned out. Thus, Musso et al fail to disclose extruded filaments that include a first composition encased within a second composition, where the finished article is formed from the second composition and the first composition is removed to provide channels within the finished article as claimed in claim 1.

Consequently, Musso et al. fail to teach every element of the invention of claim 1, as well as claims 2 and 5-7 and new claims 27-31, as required under 35 USC §102(e). Applicants respectfully submit that pending claims 1-14, as well as new claims 27-31, are in condition for allowance.

Claim Rejection Under 35 USC §103

Claim 3 stands rejected under 35 USC §103(a) for being unpatentable over Musso et al., in view of Hoopman, U.S. Patent No. 5,317,805. Claim 4 stands rejected under 35 USC §103(a)

for being unpatentable over Musso et al., in view of Hoopman and Davenport, U.S. Patent No. 3,222,144. Claim 7 stands rejected under 35 USC §103(a) for being unpatentable over Musso et al., in view of Hanaki et al., U.S. Patent No. 4,746,479. Claims 8-10 stand rejected under 35 USC §103(a) for being unpatentable over Musso et al., in view of Avakian, U.S. Publication No. 2004/0106713. Claims 8 and 9 stand rejected under 35 USC §103(a) for being unpatentable over Musso et al., in view of Ocher et al., U.S. Publication No. 2003/0131476. Claims 11 and 12 stand rejected under 35 USC §103(a) for being unpatentable over Musso et al., in view of Rainer et al., U.S. Patent No. 5,533,258. Claim 13 stands rejected under 35 USC §103(a) for being unpatentable over Musso et al., in view of Rossi, U.S. Publication No. 2002/0037142. Claim 14 stands rejected under 35 USC §103(a) for being unpatentable over Musso et al., in view of McCullough, U.S. Patent No. 6,093,961. Reconsideration and withdrawal of these rejections is requested.

As discussed above, Musso et al. fail to disclose, teach or suggest a method for manufacturing a heat exchanger from one or more extruded filaments that include a first composition encased in a second composition, where the first composition is subsequently removed and the second composition forms the heat exchanger, as presently claimed. None of Hoopman et al., Davenport, Hanaki et al., Avakian, Ocher et al., Rainer et al., Rossi, and McCullough suggest the method of manufacture as claimed and do not provide any teachings to cure the deficiencies of Musso et al. Accordingly, Musso et al., Hoopman et al., Davenport, Hanaki et al., Avakian, Ocher et al., Rainer et al., Rossi, and McCullough, either alone or in combination, do not disclose, teach or suggest the invention of claims 3, 4, 7, and 8-14, and claims 3, 4, 7, and 8-14 are not obvious.

In view of the above, reconsideration and allowance of the pending claims are respectfully requested.

CONCLUSION


In view of the above amendments and remarks, prompt reconsideration and full allowance of the claims pending in the subject application are respectfully requested. All rejections have been addressed. Applicants respectfully submit that the instant application is in condition for allowance and respectfully solicit prompt notification of the same.

The Commissioner is authorized to debit or credit our Deposit Account No. 19-0733 for any fees due in connection with the filing of this response.

If the Examiner has any questions, the Examiner is invited to contact the undersigned at the number set forth below.

Date: February 27, 2006

Respectfully submitted,

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